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ABSTRACT

A study was conducted to determine whether primary school children who were taught reading with an experimental modality prescriptive-diagnostic reading program achieved higher reading comprehension scores in the intermediate grades than did children who were taught reading with a traditional reading approach. The experimental group was composed of 369 children, while the traditional group consisted of 385 children. T-tests were used to locate significant differences between the children's third and fifth grade mean equivalent scores and their third through fifth grade mean gain scores on the reading comprehension section of a standardized reading test. The Cognitive Abilities Tests nonverbal aptitude scores were also compared by T-tests. Both the traditional and the experimental reading approaches were found to produce similar results in reading comprehension. (Author/FL)

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# THE EXPERIMENTAL MODALITY PRESCRIPTIVE-DIAGNOSTIC READING PROGRAM VERSUS A TRADITIONAL READING PROGRAM

A THESIS

SUBMITTED TO THE FACULTY

OF THE GRADUATE SCHOOL OF EDUCATION

OF

RUTGERS

THE STATE UNIVERSITY OF NEW JERSEY

BY

GALE PEACEMAN LACKNER

IN PARTIAL FULFILLMENT OF THE

REQUIREMENTS FOR THE DEGREE

OF

MASTER OF EDUCATION

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NEW BRUNSWICK, NEW JERSEY MAY, 1979

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COMMITTEE CHAIRPERSON: Edward B. Fry, Ph.D.

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ABSTRACT

The purpose of this study was to determine if children in the Long Branch, New Jersey Public School System, taught reading in the primary grades with an experimental modality prescriptive-diagnostic reading program, achieved higher reading comprehension scores in the intermediate grades than those children taught reading with a traditional reading approach.

T-tests were used to locate significant differences between their third and fifth grade mean equivalent scores and their third through fifth grade mean gain scores on the reading comprehension section of the Iowa Tests of Basic Skills (ITBS). The Cognitive Abilities Tests (CAT) non-verbal aptitude scores were also compared by T-tests for the groups. These were later used for analyses of covariance to adjust the means, since the groups were nonequivalent.

Only children within the Long Branch School System for at least first, third and fifth grades were included in the study. The total number of children in the traditional group was 385, and the total number of children in the experimental group was 369.

Neither the traditional or experimental reading approaches were found to produce significantly ($p < .05$) higher reading comprehension scores. When separated, boys and girls tended to do equally well with both the experimental

and traditional reading approaches. However, one of the seven elementary schools in Long Branch was found to have had significantly higher reading scores for fifth grade children who had been taught experimentally.

The data confirms that both the traditional and experimental reading instruction methods produce similiar results in reading comprehension, yet the experimental modality prescriptive-diagnostic reading approach seems to have a slight edge.

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# CHAPTER I

## INTRODUCTION

A child's ability to learn to read depends upon his learning strengths and weaknesses, or his preferred learning modality. According to Lerner (1976) "children appear to have one optimal perceptual modality for learning. While some children learn most efficiently through their ears or by listening [auditory modality], others learn best through their eyes [visual modality]," (p. 171). For this reason, many educators believe that reading instruction should possibly take these individual differences into consideration.

Wepman (1968) stresses that since reading "cannot be considered the product of any single modality, but rather a confluence of them all," (p. 6) it is important, therefore, to also remediate and strengthen the area, be it visual or auditory that is weakest.

Morency and Wepman (1973) believe that one "solution to the problem of underachievement in elementary schools is early modality grouping, which exploits for teaching purposes the modality that functions most adequately to support cognitive learning. Another solution is to attempt to improve the less well-developed modality through direct intervention," (p. 326).

In 1973 the Long Branch, New Jersey Public School System, put into operation, an experimental Modality Prescriptive-Diagnostic Reading Program designed to identify each individual child's learning mode. Most of the modality emphasis takes place within kindergarten through second grades. Deficient skills are remediated while strong skills are used for instruction. This program was initiated because it was felt that the District's reading scores were too low. All of the seven elementary schools in the Long Branch School District were involved with the experimental prescriptive-diagnostic program.

Each child is given a battery of tests in the kindergarten and first grades to determine his strengths and weaknesses in the areas of visual discrimination, visual memory, auditory discrimination, auditory synthesis, auditory figure ground, letter recognition - upper and lower case, visual motor integration, and motor speed and accuracy. From the results of these tests, the child is placed in a reading program which emphasizes his learning modality. The child who is deficient in auditory skills and is strong visually, is placed in a combination analytic, phonetic, sight word basal reading program-Macmillan Readers, (Harris, Clark, 1970); Houghton Mifflin Readers, (Durr, LePere, Alsin, 1971); or Scott Foresman-The New Basic Readers, (Robinson, Monroe, Artley, Huck, Jenkins, 1965). The child who is strong auditorily is placed in a synthetic

phonic-auditory basal program-Lippincott's Basic Reading, (McCracken, Walcutt, 1969, 1970, 1975) or The Economy Company-A basic Reading Series, (Harris, Creekmore, Greenman, 1960, 1962, 1965, 1967, 1972, 1973). For those children deficient in auditory as well as visual areas, a Language Experience approach is utilized.

Along with the children being placed in a reading program oriented towards their specific learning modalities, they are remediated in all of their deficient areas either within skill groups in the classroom or by a remedial reading teacher. They are continued in the same basal series through 6th grade.

The traditional approach which preceded this Prescriptive-diagnostic method involved combination basal readers only-Macmillan Readers, (Harris, Clar, 1970); Houghton Mifflin Readers, (Durr, LePere, Alsin, 1971); or Scott Foresman-The New Basic Readers, Robinson, Monroe, Artley, Huck, Jenkins, 1965) with no particular diagnosis used for determining which children would best benefit from any one basal series. There was no continuity from year to year either, as the child was placed in whatever books were available in the particular classroom. No determination of visual or auditory deficiencies were made, and therefore, no remediation was given to remediate them. Some supplemental reading was available under Title I for a few first and second graders. Not all schools were included, and nothing was done for kindergarteners.

Statement of the Problem - Hypotheses

This study is concerned with whether or not the Long Branch Diagnostic-Prescriptive Modality Reading Program has produced higher reading comprehension scores than the traditional program employed before 1973.

The questions considered in this study include:

1. Do students who have had the experimental modality, prescriptive-diagnostic reading approach, read better than those who have had the traditional reading approach at grades three and five?

2. Are the mean gain scores between the third and fifth grades higher for the traditional approach or the experimental approach?

3. Will boys or girls read more successfully with the traditional or experimental modality, prescriptive-diagnostic reading approaches?

4. Will any one school within the Long Branch District benefit more from the experimental reading approach?

Hypotheses

1. There will be no significant difference between the reading comprehension subtest on the Iowa Tests of Basic Skills (ITBS), mean scores of students in third and fifth grade, between students taught with the experimental modality, diagnostic-prescriptive approach, and those taught with the traditional approach.

2. There will be no significant difference in the ITBS means of the third and fifth grade gain scores, between

the traditional and experimental approaches. (The gain scores being the differences between the third and fifth grade scores).

3. There will be no significant difference in third and fifth grade mean reading comprehension scores or gain scores between traditionally and experimentally taught girls and between traditionally and experimentally taught boys.

4. There will be no significant difference in third and fifth grade mean reading comprehension scores or gain scores for each of the elementary schools in Long Branch between the traditional Group 1 during years of 1973 (grade 3) and 1975 (grade 5), and the experimental Group 4 during years of 1976 (grade 3) and 1978 (grade 5). (See Table 1 for group clarification).

Definition of Terms

Experimental Approach--refers to Long Branch's new reading program, incorporated in 1973, where each child's learning modality is determined through a battery of tests. The child is then taught according to the learning mode.

Learning Modality--refers to a child's ability to learn to read best either by a visual - whole word, or auditory-phonic decoding approach.

Traditional Approach--refers to Long Branch's reading program prior to 1973 and until 1977 (sixth grade only). Use of regular basal series - books determined by reading

level only. No special attention given to learning mode.

Overview of the Study

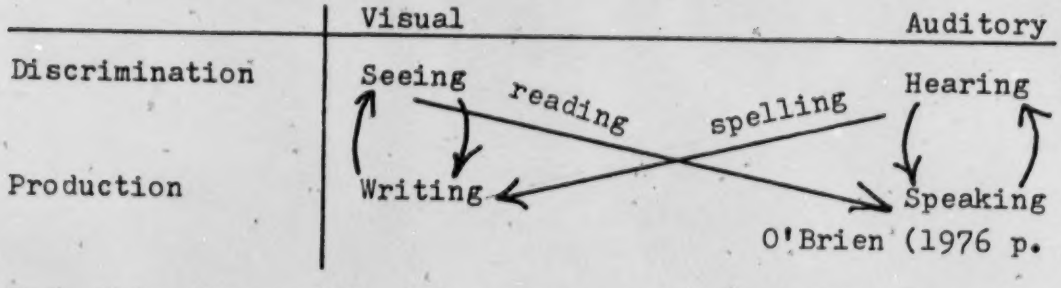
This study is concerned more with the evaluation of this modality diagnostic-prescriptive reading system in Long Branch, rather than in specific research on the particular method, materials, or teaching styles.

In the following chapter, a literature search provides information on other research done in the area of learning modalities.

The research is divided into three sections: (1) The Modality Concept, (2) Supportive Research - in reading instruction, with regard to preferred learning modalities, and (3) Non-Supportive Research - in reading instruction with regard to preferred learning modalities.

O'Brien (1976) breaks the visual modality into two distinct parts and does the same with the auditory modality. Both modalities involve discrimination and production. The breakdowns are visual discrimination, or seeing; visual production, or writing; auditory discrimination, or hearing; and auditory production, or speaking. Included in this article on page 3 is a diagram which shows this breakdown of the visual and auditory modalities and their relationship to reading and spelling.

Modality Concept




O'Brien (1976 p. 3)

From this diagram it can be shown that both modalities are necessary in reading. The visual discrimination skills involved in seeing together with the auditory production skills involved in speaking are both important for reading. The auditory discrimination skills involved in hearing together with the visual production skills in writing are both necessary for success in the spelling skills.

Wepman (1971) states that each individual generally develops using one particular modality to a greater extent in his learning. In other words, all of the modalities are usable by the individual, yet one, either "visual, auditory or haptic (touch) is dominant" (p. 5). It is suggested that

the strength of the particular modality is developed within the individual, rather than as a result of his external surroundings. Research by Morency (1968) cited in this article states that the modalities develop at different rates, but they seem to equal out at approximately nine years of age. For this reason Wepman points out that, a child who is slow in developing a specific modality, is not necessarily retarded and is not perceptually handicapped, but instead this is normal for some children. If by nine years old, the child is still deficient in the development of a modality, it should definitely be strengthened with specific training.

Modalities and Reading

From their literature research, Silverston and Deichmann (1975) have determined that there are two basic beliefs held in perceptual-visual or auditory development in reading. The first is that perceptual growth in reading is a result of sequential development of discrimination skills. Difficulties in reading in this case transpire when one of the skills on a lower level has not yet been mastered. These skills are learned. The second belief is that the perceptual skills are developed maturationally. (This would agree with Wepman and Morency).

One conclusion from their research is that "gradual auditory ability improvement appears to be a possible

requisite for the early stages of reading development," (p. 167). This conclusion would seem to support the need for instruction in auditory skills for any child deficient in that learning modality.

Wolpert (1971) finds it difficult to divide reading instruction into two separate modalities and describe them as either visual or auditory. He believes that reading involves both auditory and visual skills, although one program might be visually oriented, it still requires auditory skills. This would appear to agree closely with O'Brien's (1976) explanation of reading that reading is a result of both visual discrimination and auditory production.

Wepman (1968) goes along with Wolpert's belief that reading is a result of both visual and auditory skills. He suggests that if a child appears to be deficient in any one area, visual or auditory, the basis of remedial instruction should be provided to improve the deficient area.

Strang (1968) agreed with Wepman's stand. She emphasizes the need to take a child's learning modality preference into consideration for instruction purposes. She believed that a child should be taught to utilize his modality strength since this would enable the child to be successful. Besides teaching to the strength, it would be useful to improve the deficient area with specific instruction. She has found that "in beginning reading, a combination of two sensory channels - auditory and visual was more

efficient with less able learners than a single sensory channel. Writing the words being taught further aided retention for some subjects," (p. 134).

Wolpert (1971) also believes that auditory and visual perception tests are not enough to determine whether or not a child is an auditory or visual learner, because (1) perception is only part of learning, and (2) perception tests are non-reading oriented.

Partridge (1976), through her research also sees a need for "more definitive testing instruments," (p. 14) for determining learning modalities.

Modality and Maturation

Morency (1968) contended that auditory discrimination, memory and perception were important influences on whether or not a child with average ability had difficulty in learning to read. She tested 179 children when they were in first grade, second grade and third grade in the areas of auditory memory and discrimination, visual memory and discrimination, I.Q. and on appropriate level Metropolitan Achievement Tests. She concluded that perceptual ability progresses developmentally; by age nine perceptual modalities should be mature; a child who increases ability in one mode might or might not increase ability in other modes, each child progresses at different rates in the modalities depending on preference; and perceptual problems in the first year of school could influence school achievement up

at least grade three. Morency holds the belief that "for purposes of individual maximum potential education - ability grouping on the basis of modality preference as shown by test results would seem in order," (p. 21).

According to Wepman (1971) "It is more important for us to know how a child learns than to know how much he has learned," (p. 9). With this information, it is possible to instruct the child in a way in which he can best benefit.

The Long Branch experimental diagnostic-prescriptive modality reading program takes into consideration some of the above ideas. The skills tested and used for modality determination involved auditory discrimination, visual discrimination, visual memory, auditory synthesis, auditory figure ground, visual motor integration and motor speed and accuracy. The children are taught reading in the primary grades according to their "preferred" learning modalities while their deficient areas are also remediated.

Much of the research is contradictory. Some studies definitely state the positive effects involved in teaching reading to a child by incorporating his specific learning modality into the approach. A similar number of individuals have found very little significant data supporting positive effects of instruction in reading according to a child's preferred learning modality.

## Supportive Research-With Regard To Preferred Learning Modalities

### Research in the Primary Grades

Elenbogen and Simmons (1972) identified children at the end of kindergarten who would possibly have reading problems in the future. The purpose of the study was to organize a program to deal with their individual needs. Based on a battery of tests in the area of I.Q., visual, auditory, language and motor skills, four reading groups were formed. One for those children with no severe deficiencies, one for visual deficiencies, one for auditory deficiencies and the last group for those children deficient in both areas.

Results showed the special reading groups mean scores at the end of second grade to be on grade level. For children with serious initial deficits, this program appeared to be successful.

From the results, the authors conclude that "early diagnosis of the skills necessary for success in the reading task is effective in establishing direction for the teaching of reading. Modality strengths provide an avenue of learning while language problems, motor deficits and modality weaknesses are being remediated," (p. 48).

Neal (1968) explored the influence perceptual instruction in kindergarten had upon reading performance in first grade. Twenty-eight kindergarten classes were involved in this study. All twenty-eight had language experience within

the class, but fourteen randomly selected classes also had perceptual training to increase the children's perceptual skills such as visual and motor skills.

The children who had had the experimental perceptual training in kindergarten had significantly more growth in first grade in "both perception and word recognition achievement," (p. 100). From the results the author observes that "growth in perception, creativity and communications skills might be the goal of kindergarten and preschool programs," (p. 101).

Ekwall (1976) states after reviewing research, that he can "agree with the position that it is probably better to begin reading instruction in the stronger of the learning modalities, if they can be identified, while attempting to strengthen the weaker modalities at the same time," (p. 247). This would be consistent with Wepman (1968).

Betts (1946) also states in his book that if a child "appears to be deficient in auditory, visual or kinesthetic associative learning skills, then the instructional procedures must be differentiated to meet his needs," (p. 585).

Research With Older Children

Bursuk's (1971) study involved 132 adolescents with I.Q.'s between 92-114 who were deficient in reading. The purpose was to determine if instructing them in reading by a combination of auditory and visual modalities, or by a predominantly visual approach had any impact on reading scores.

The students were given the Sequential Test of Educational Progress, Reading Test, Form 2A and Listening Test Form 2A. These scores were used to identify students as auditory, visual, or no preference learners. They then were randomly divided into three groups (visual, auditory, or no preference learners) of thirty students each. Fifteen from each group were given a combination program involving both auditory and visual instruction. Fifteen from each group were given a mainly visually oriented approach.

The California Reading Test, Advanced level, Form X given as post-test. (Form W was pre-test). Results showed that: (1) students with combination aural-visual instruction made significantly more growth than those taught only visually, (2) growth was also greater when students had been taught in their modal preference, (3) combination of aural and visual instruction was more successful for auditory learners and those with a preference, and (4) the visual approach showed more successful growth for those who were visual learners.

Bursuk suggests testing remedial students for modality preference before beginning instruction and teach to that preference. If this isn't possible then the next best step is to teach reading via a combination aural-visual approach. (This study only considered disabled readers).

Morency and Wepman (1973) investigated the influence of a child's initial "perceptual processing ability on

later school achievement," (p. 323). This study implied that a child who had developed slowly and was deficient in certain perceptual skills in the beginning of his school career would have difficulty catching up. In fact his achievement would generally be slower than a child who was not slow developing perceptual skills. It is important to note that according to Morency (1968) the maturation of perceptual skills is at approximately nine years of age.

The results did show that a child's initial perceptual abilities have an effect on future performance in school. The results indicate the importance of visual and auditory "functioning to the overall performance of the child in school and emphasize the urgent need to include this parameter when planning early education," (p. 326).

## Non-Supportive Research-In Instruction Of Reading With Regard To Preferred Learning Modalities

### Modality Preferences

Cullinan, Ringler, Smith (1969) attempted to determine the "relationship between preferred learning modalities and differentiated presentations of reading tasks with beginning readers," (p. 1) (differentiated presentations consisted of reading instruction in four different modes--auditory, visual, kinesthetic and a combination approach).

1. One hundred and six first grade children had learning mode testing to determine preference. (N. Y. University Modality Test).

2. Pre and post criterion word recognition testing. (Author developed).

3. N. Y. State Readiness Test.

From the testing, mode preference was determined. Children were divided into four groups -- Auditory, Visual, Kinesthetic, Combination, and Control. The four mode groups received small group instruction in that particular mode along with the regular first grade program. The control group had only the regular reading program.

The findings show "no significant differences among groups when they were considered as total treatment groups (differentiated types of word presentation) or as like treatment - modality preference and unlike treatment - modality preference groups on either word recognition criterion test or the Metropolitan Reading Achievement, Primary I Test," (p. 22).

After Jones (1971) reviewed the research studies of Bateman (1968); Robinson (1968); Jones (1970); Bruininks (1968); Cripe and Wilson (1966); deHirsh, Jansky and Lanford (1966); and Bursuk (1971); which all involved the use of auditory and visual modalities in the instruction of reading, the author found that only "Bursuk (1971) firmly supported the theory that the modal preference of an individual should be considered in teaching him to read," (p. 7).

From the results of this research, the author believes that one can not say "find the modality of the learner and teach reading in accordance to it."

Bruininks (1968) tried to determine if "matching teaching approaches to the auditory or visual perceptual strengths of second and third grade disadvantaged Negro boys would facilitate the learning of words they were unable to read at the outset of the experiment," (p. 8).

To determine the preferred learning modalities, each child was tested in visual memory, perceptual speed, auditory memory, visual perceptual closure, visual-motor memory.

Each child was taught fifteen words phonetically, and fifteen words by a visual approach. Results showed that matching teaching methods to learning modality preference of disadvantaged second and third grade boys made no significant difference in the learning of thirty unknown words. "They learned words equally well," (p. 38) when taught with methods corresponding to their weaknesses or their strengths.

The author suggests from his results that the development of word recognition skills are neither hindered nor improved by teaching to a child's preferred modality strength or to his weaknesses.

Integrated Approaches

Robinson (1972) attempted to determine whether or not children who have a strong visual learning modality and are weak auditorily, learn to read more successfully with a sight-word method; and do children who are weak visually learn to read more successfully with a phonic method.

The author found that "neither a phonic nor a sight method of teaching proved to be significantly more effective with children who exhibited the most marked differences in visual or auditory modalities," (p. 35).

Regardless of teaching method employed, "auditory discrimination made a significant contribution to reading achievement at both first and third grade," (p. 35).

Robinson suggests that in order for any child to read successfully, he must be able to discriminate both sounds (auditory skills) and letters (visual skills) since both are involved in the total process of reading.

Bateman (1968) looked at the effectiveness of an auditory reading approach as compared to a visual approach for beginning reading instruction.

Eight first grades were involved in the study. Four were control classes - the children's learning modalities were not identified. They were randomly placed in either an auditory or visual reading program. In the other four classes the children were identified as either auditory or visual learners. From that information, four new classes were organized (1) Auditory learners - taught auditorily, (2) auditory learners taught visually, (3) visual learners taught visually, and (4) visual learners taught auditorily. The main results were as follows: "The auditory method of reading instruction was superior to the visual method for both reading and spelling to the visual modality-preferred

subjects; and there was no interaction between the subjects" preferred modality and the method of instruction used," (p. 110). The author also states that reading is a result of both modality skills.

Vandever and Neville (1974) tried to determine whether or not a student who was taught words using his modality strength could learn more words than a child taught in a way regardless of modality preference.

Second grade students were taught several words a week for six weeks in groups which reflected: visual strengths, visual weaknesses, auditory strengths, auditory weaknesses, kinesthetic strengths, or kinesthetic weaknesses. In all groups there were no differences in the number of words learned. Modality had very little influence.

The authors inferred from their results that reading involves certain skills regardless of modality. They also believe that no particular reading method can involve only auditory or visual skills. The authors state that "time spent in identifying children as having a modality strength might be better spent in instruction," (p. 200).

The research in regard to reading and modalities is conflicting. What seems to emerge is the idea that reading is the result of <u>both</u> visual and auditory skills.

This idea can either support the need to strengthen weaker modalities and teach to the stronger one, but it can

also dispute the idea by explaining that both skills are necessary for instruction and they, therefore, cannot be separated.

More of the research appears to show little difference in reading between those who have had modality reading instruction and those who have not.

In conclusion, Spache (1976) suggests that since results differ and successful teaching - utilizing a modality approach is not necessarily apparent. It might still be worthwhile in that a child can experience success more readily within his specific learning modality and, although this may have no real influence on his future achievement and progress, his motivation could improve. Positive motivation, in itself, is worthwhile.

# CHAPTER III

## PROCEDURE

Chapter three discusses the general population of the Long Branch, New Jersey, Public School District; the reading comprehension and intelligence instruments utilized for evaluation of the Long Branch reading program, the tests involved in initial modality identification, the methodology involved in this evaluation, and the design of the study.

### Population of the Study

Long Branch is an urban, shore community with a varied population of over 31,000 people.

According to the characteristics of the population, part 32 (1973), the 1970 United States Census statistics, Long Branch has a 17% Black and other race population. Eighteen and nine-tenths percentile of the population is employed in manufacturing. Fifty and seven-tenths percentile is employed in white collar positions and 20.7% are government workers. Unemployment is 6.9%.

The median family income was $8,950. in 1970, with 9.6% of the population below the poverty level, and 19.5% above $15,000.

For individuals over 25, the median school years completed are 12.1, 53.2% finished four years of high school or more.

To insure that the subjects included in the experimental group were really taught with the prescriptive-diagnostic modality program, the test data is comprised of scores only from those children who were in the Long Branch District for the first, third, and fifth grades.

The experimental program was slowly introduced into the District in 1973 in the first grade classes. The subjects' grades and years in the traditional or experimental approaches are shown in Table 1.

Two groups of children are used for the traditional approach scores, and two groups of children are used for the experimental approach scores.

A group is comprised of children who have attended the Long Branch School District for first, third, and fifth grades during prescribed years, i.e., group 1 consists of children who were in the Long Branch School District for first grade in 1971, third grade in 1973, and fifth grade in 1975. They received traditional instruction.

The Instruments

Since this is a Post Hoc study, the test data was already available. The main test data to be incorporated into this study are the Iowa Tests of Basic Skills (ITBS)

TABLE 1

EXPERIMENTAL READING PROGRAM INTRODUCTION
INTO LONG BRANCH SCHOOL SYSTEM

| Years | Grades | | | | | |
|---|---|---|---|---|---|---|
| | first | second | third | fourth | fifth | sixth |
| 1971 | T group 1 | T | T | T | T | T |
| 1972 | T group 2 | T | T | T | T | T |
| 1973 | E group 3 | T | T group 1 | T | T | T |
| 1974 | E group 4 | E | T group 2 | T | T | T |
| 1975 | E | E | E group 3 | T | T group 1 | T |
| 1976 | E | E | E group 4 | E | T group 2 | T |
| 1977 | E | E | E | E | E group 3 | T |
| 1978 | E | E | E | E | E group 4 | E |

T = Traditional Program
groups 1 and 2 included
in study.

E = Experimental Program
groups 3 and 4 included
in study.

(Hieronymus and Lindquist, c. 1971) levels 9 and 11 (third and fifth grades) reading comprehension scores for each child. Also included will be the third grade Cognitive Abilities Test (CAT) (Thorndike and Hagen, c. 1971) non-verbal score for each child.

According to the Iowa Tests of Basic Skills Manual for Administrators, Supervisors, and Counselors (Hieronymus and Lindquist, c. 1974) the ITBS was standardized along with the Cognitive Abilities Test in October and November, 1970. Communities of all sizes in the Northeast, Midwest, Southeast, Southwest, Far West were utilized as were both public and Catholic schools, to give an extensive representation. There was also a fair representation of racial and ethnic groups included.

The Iowa Tests of Basic Skills (1971) incorporates all of the levels into one form booklet. The student is instructed to begin at different points depending upon his/her level.

The comprehension section measures students' ability to locate and understand facts, details, main ideas, and sequencing in a selection, and to evaluate what he has read.

Reliability was determined for split-halves on all levels with a Pearson Product Moment Correlation. For level 9, (grade three) the reading comprehension correlation was .91. For level 11 (grade five) the reading comprehension correlation was .93.

Equivalent Forms reliability was also given and for grade three the correlation for reading comprehension was .84 and for grade 5 the comprehension reliability coefficient was .86.

Depending upon score level the standard errors of measurement for reading comprehension, grade three ranged between grade equivalents of 3.5 and 4.7, and for grade five the range was between 4.0 and 6.0.

In the Buros Eighth Mental Measurement Yearbook (1978), F. Pyrczak reviewed the ITBS and considers it to be "an excellent measure of basic skills. It is one of the most carefully constructed achievement tests available," (p. 58).

The Cognitive Abilities Test (Thorndike and Hagen, (1971) nonverbal battery, tests the students' ability to work with Figure Classification, Figure Anologies, and Figure Synthesis. No reading or number knowledge is required. There is very little relationship between these skills and formal education. It should, therefore, be a good test of intelligence and thinking skills, regardless of reading ability.

The Kuder-Richardson formula #20 was used to determine internal consistency and reliability. This is discussed in the Cognitive Abilities Test Examiner's Manual (1971). For the test level A (grade three) and nonverbal section, the reliability was .949. The Cognitive Abilities Test does

not use the term I.Q. but uses the term Standard Age Score with a mean of 100 and a standard deviation of 16. (One hundred at a particular age group is the average for that age group.)

Concurrent validity was determined by correlating the CAT to the Iowa Test of Basic Skills. The nonverbal section for third grade had a .52 correlation to reading comprehension for third grade. The verbal section had a .78 correlation to reading.

As far as content validity is concerned, the non-verbal does measure ability without any numbers or words.

In the Buros Eighth Mental Measurement Yearbook (1978), Kenneth Hopkins shows the "median correlations of the CAT with the Lorge-Thorndike Intelligence test over a six-month period for seventh and ninth graders was .73 for non-verbal...showing an adequate stability," (p. 258).

Although modality testing itself is not a part of this study, it is important in the initial student classification and plays a major role in the instruction organization. For this reason the tests and processes involved in organizing the prescriptive-diagnostic modality reading program will be discussed.

In the beginning of the year, every kindergarten child is given an individual screening test by a remedial reading teacher. The Cognitive Skills Assessment Battery

(Boehm, and Slater c. 1974) is utilized for this purpose. It tests number knowledge, multiple directions, visual-motor coordination, symbol discrimination, visual and auditory discrimination and large-motor coordination. Any section failed is remediated either in classroom skill groups or by a remedial reading teacher.

The test is given with a card manual - a child response sheet and blocks.

The technical information in the preliminary interpretive manual is rather vague in certain respects. The authors state that content validity was achieved by first determining areas of importance to be included by "teacher reports, classroom observation and inspection of curricular materials," (p. 7). The test was comprised only of items that were deemed necessary and relevant from the above observations. The items were then tried out and the only ones kept were those that the teachers felt really identified ability or lack of ability in a particular area.

The test was preliminarily tried out on 383 pre-kindergarteners and 515 kindergarteners throughout the United States, with the greatest proportion in the North East. The field testing was done in urban, suburban, and rural areas with both low and middle class students. The testing was performed both in the beginning and at the end of the year. A table in the manual breaks down each item into responses given by trial pre-kindergarten and kindergarten children.

At the end of both kindergarten and first grades, the following tests are given in Long Branch:

1. Kindergarten Auditory Screening Tests (KAST) (Jack Katz c. 1971) Parts 1, 2, and 3 are given individually to observe the child's ability in Auditory Figure Ground (test 1), Auditory Synthesis (test 2), and Auditory Discrimination (test 3). The KAST utilizes a record. Part 1 has increasingly louder background noise while verbal instructions are given. In section 2, the record narrator says a word by sounds and the child must mark the picture from a choice of four. For example, d-o-g, the child must mark the picture of the dog. In test three, the child must distinguish between same and different words. The score sheet is within the child's answer book.

The KAST was devised through four years of several trials with several hundred kindergarteners and first graders.

The final trial testing was performed on 600 kindergarteners and first graders in January, 1971 in Massachusetts, Oregon, Texas, Illinois and Missouri. Pass/Fair scores were derived from this final field testing.

2. Monroe Reading Aptitute Tests (Marion Monroe, c. 1935) Test 3 - Visual Memory is used for the Long Branch testing.

In this test the child is shown a card for 10 seconds with four pictures on it. The child has to draw what

he remembers. This is done four times with four separate cards. The test is given by the reading teacher individually.

In the Third Mental Measurement Yearbook (1949), Irving H. Anderson reviewed the test briefly. He states that the "norms show that high and low scores on the total test are good predictors of success and failure in beginning reading," (p. 550).

3. Detroit Tests of Learning Aptitude (H. Baker, and B. Leland, 1967), Test 5 - Motor Speed and Accuracy is given individually to each child by a remedial reading teacher.

The child is given two minutes to put an X exactly within circles of gradually descending size. For example ⊗ (the X cannot go outside of the circle).

The full test consists of 19 subtests, but Long Branch uses only Test 5. Initial norming was done with 50 students at each age level from 3-19, with I.Q.'s between 90 and 110.

The examiner's handbook states that "test reliability was sampled first on 48 cases with a correlation of .959 ± .01 after an interval of five months between first and second testings," (p. 30).

4. Developmental Test of Visual Motor Integration (VMI) (Keith E. Beery, 1967). This is a test of visual motor integration, or a child's ability to copy and draw

shapes. The child is given 15 minutes to correctly copy as many of the 24 shapes as possible. This test is group administered in the classroom.

The administration and scoring manual discusses validity very slightly. "The correlation between Visual Motor Intergration scores and chronological age is .89 for the two to fifteen age range. VMI correlations are higher with mental age than with chronological age," (p. 11). Within this handbook, Beery gives suggestions for remediation, and scoring.

In Buros Seventh Mental Measurement Yearbook (1972), Brad Chissom reviewed the VMI and stated that the instructions for administering the test are easy to understand, yet the scoring can be subjective. He does not feel there is a sufficient amount of reliability information available.

5. The Long Branch Alphabet Constructive Test, a. Upper case, and b. Lower case (c. 1973-unpublished).

This test is group administered and was devised within the system. The children are directed to write randomly dictated letters. The first test is upper case letters and in the second test lower case letters are dictated.

In kindergarten only, the following tests are given:

1. Betts Ready to Read Test (E. A. Betts 1936), part three letter group discrimination is group administered. The children have to look at the first letter combination

and locate the same combination on a line of 5 choices. This is a visual discrimination task.

A discussion of the Betts test on the whole is given in the 1938 Mental Measurement Yearbook by a number of individuals. No reliability or validity information is offered.

2. Long Branch Alphabet Selective Recognition Test, a. Upper case, and b. Lower case (c. 1973-unpublished) is group administered and the children are directed to circle certain letters. This is done on one test for upper case letters, and on another test for lower case letters.

Administration of Tests

The Iowa Test of Basic Skills (Hieronymus and Lindquist, c. 1971) was given to each child in grade three and grade five. In grade three, the children received level nine and in grade five they received level eleven. They were administered in the beginning of the school years.

The Cognitive Abilities Test (Thorndike and Hagen, c. 1971) was administered to children in grade three.

Treatment of the Data

Children who have been in the District in first, third and fifth grades were matched up. The reading comprehension scores are only used from this group. Any child not within the District for the above amount of time, was eliminated from the study. This was to insure that the scores utilized for the experimental prescriptive-

diagnostic years are truly scores of children who have had this type and only this type of reading instruction in school.

T-Tests were applied to determine significance between experimental and traditional third grade reading comprehension mean scores; between experimental and traditional fifth grade reading comprehension means scores; and between experimental and traditional third through fifth grade reading comprehension mean score gains of only those children who have also had primary reading instruction in Long Branch (been in District since first grade). T-Tests were also used to determine significance in the above areas between traditional and experimental years for boys and girls between traditional Group 1 (first grade 1971, third grade 1973 and fifth grade 1975) and experimental Group 4 (first grade 1974, third grade 1976 and fifth grade 1978) for the individual schools within the District. The seven elementary schools are: Anastasia, Broadway, Elberon, Garfield, Gregory, Lenna Conrow and West End.

Since four separate years and the entire Long Branch District (all 7 elementary schools) are involved in this experimental reading program, no randomization exists. To compensate for this, third grade nonverbal Cognitive Abilities Test scores (I.Q.'s) were used as a control variable. The hypotheses was tested both with mean scores and adjusted mean scores, using the I.Q. scores on the CAT as the covariate.

The unit of analysis was grade-equivalent scores.

Experimental Design

This study involved an Ex Post Facto design (Tuckman, 1972, pp. 123-127) with a Nonequivalent Control Group. It could be diagrammed the following way:

$X_1 \quad O_3 \quad O_1 \quad O_2$

$X_2 \quad O_3 \quad O_1 \quad O_2$

$X_1$ = Experimental Reading program mostly between kindergarten and third.

$X_2$ = Traditional reading program mostly between kindergarten and third.

$O_1$ = Iowa Test of Basic Skills - level nine - grade three.

$O_2$ = Iowa Test of Basic Skills - level eleven - grade five.

$O_3$ = Cognitive Abilities Test - nonverbal score - grade three.

## CHAPTER IV

## FINDINGS AND DISCUSSION

This chapter presents the resulting statistics and data for the traditional reading approach in comparison to the experimental modality prescriptive-diagnostic reading approach in the Long Branch Public School System.

### Presentation of the Data

The first hypothesis states there will be no significsnt difference between reading comprehension mean scores of students taught reading with the experimental modality diagnostic-prescriptive approach, and those taught with the traditional approach in third and fifth grades.

The data in Tables 2 and 3 deal with the first hypothesis. Table 2 gives the mean scores and Table 3 gives the adjusted mean scores. The traditional group has a total n of 385, and the experimental group has a total n of 369. These groups include only children who have been within the Long Branch School District for first, third and fifth grades.

The Iowa Tests of Basic Skills (ITBS) grade equivalent scores are as follows: Reading comprehension mean scores for third grade are: Traditional-3.08, Experimental-2.94. The $t$=1.75 and is not statistically significant at the .05 level. The reading comprehension mean scores for

TABLE 2

READING COMPREHENSION MEAN GRADE EQUIVALENT SCORES ON THE IOWA TESTS OF BASIC SKILLS AND NON-VERBAL COGNITIVE ABILITIES TEST (I.Q.) MEAN SCORES

| Group | n | non-verbal aptitude I.Q. | Reading | | 3rd-5th Gains |
|---|---|---|---|---|---|
| | | | 3rd Grade | 5th Grade | |
| Total | | | | | |
| Traditional | 385 | 97.76 | 3.08 | 4.81 | 1.73 |
| Experimental | 369 | 95.55 | 2.94 | 4.76 | 1.83 |
| t | | 1.88 | 1.75 | .41 | 1.44 |

Note: No significant differences at .05.

TABLE 3

ADJUSTED READING COMPREHENSION MEAN GRADE EQUIVALENT SCORES ON THE IOWA TESTS OF BASIC SKILLS

| Group | n | Reading | | 3rd-5th Gain |
|---|---|---|---|---|
| | | 3rd Grade | 5th Grade | |
| Total | | | | |
| Traditional | 385 | 3.04 | 4.75 | 1.71 |
| Experimental | 369 | 2.98 | 4.82 | 1.84 |
| t | | .89 | .81 | 1.84 |

Note: Means adjusted by I.Q. No differences significant at .05.

fifth grades are: Traditional-4.81, Experimental-4.76. The t=.41 and is not significant either.

The Cognitive Abilities Test (CAT)-non-verbal I.Q. scores for the above groups are: Traditional-97.76. Experimental-95.55.

An anlysis of covariance performed on the above reading scores or dependent variables with the CAT scores (I.Q.) as the independent variable produced the adjusted mean scores in Table 3.

The adjusted ITBS reading comprehension mean grade equivalent scores are as follows: Third grade: Traditional-3.04, Experimental-2.98. The t-test score between the two is .89, and not significant. The fifth grade scores are: Traditional-4.75, Experimental-4.82. The t=.81 and shows no significant differences. The null hypothesis is supported with this data.

The second hypothesis, there will be no significant difference in the means of the third to fifth grade gain scores between the traditional and experimental approaches, also is dealt with in Tables 2 and 3.

The ITBS reading comprehension mean grade equivalent gain scores for third through fifth grades are: Traditional-1.73, Experimental-1.83. The adjusted ITBS reading comprehension mean grade equivalent gain scores for third through fifth grades are: Traditional-1.71, and Experimental-1.84. The

t-tests show no significant differences between these scores. This null hypothesis is upheld because mean gain scores between Traditional and Experimental groups were not significantly different.

The third hypothesis, there will be no significant difference in third and fifth grade mean reading comprehension scores between traditionally and experimentally taught boys, and between traditionally and experimentally taught girls, is treated in Tables 4 and 5.

This null hypothesis is maintained because there were no significant differences for either boys or girls for experimental or traditional groups, with the exception of one significant difference favoring traditional boys at the third grade level.

The third grade mean reading comprehension scores for traditional boys is 3.02, and 2.79 for experimental boys. The $t$=2.11 (significant at .05 level). Once covaried, however, the adjusted third grade mean reading comprehension scores for traditional boys is 2.98 and for experimental boys is 2.83. The $t$=1.55, and is no longer significant at the .05 level. Raw means and adjusted means can be found in Tables 4 and 5.

The fourth hypothesis, there will be no significant difference in third and fifth grade mean reading comprehension scores or gain scores for each of the elementary schools in Long Branch, is upheld because no significant

TABLE 4

READING COMPREHENSION MEAN GRADE EQUIVALENT SCORES ON THE IOWA TESTS OF BASIC SKILLS AND NON-VERBAL COGNITIVE ABILITIES TEST (I.Q.) MEAN SCORES FOR GIRLS AND BOYS

| Group | n | non-verbal aptitude I.Q. | Reading | | 3rd-5th Gain |
|---|---|---|---|---|---|
| | | | 3rd Grade | 5th Grade | |
| Girls | | | | | |
| Traditional | 201 | 98.98 | 3.13 | 4.91 | 1.78 |
| Experimental | 189 | 97.25 | 3.07 | 4.90 | 1.83 |
| t | | 1.10 | .47 | .08 | .49 |
| Boys | | | | | |
| Traditional | 184 | 96.43 | 3.02 | 4.69 | 1.67 |
| Experimental | 180 | 93.77 | 2.79 | 4.62 | 1.83 |
| t | | 1.52 | 2.11* | .48 | 1.55 |

* Significance at .05.

TABLE 5

ADJUSTED READING COMPREHENSION GRADE EQUIVALENT MEAN SCORES ON THE IOWA TESTS OF BASIC SKILLS FOR GIRLS AND BOYS

| | | Reading | | 3rd-5th |
|---|---|---|---|---|
| Group | n | 3rd Grade | 5th Grade | Gain |
| Girls | | | | |
| Traditional | 201 | 3.10 | 4.94 | 1.78 |
| Experimental | 189 | 3.11 | 4.87 | 1.84 |
| t | | .16 | .67 | .68 |
| Boys | | | | |
| Traditional | 184 | 2.98 | 4.63 | 1.65 |
| Experimental | 180 | 2.83 | 4.68 | 1.85 |
| t | | 1.55 | .46 | 1.93 |

Note: Means adjusted by I.Q. No differences significant at .05.

differences were found except in the Anastasia School. There it was found that the experimental fifth grade raw and adjusted mean scores were significantly higher at the .05 level and this caused gain scores for the experimental group to rise significantly as well. The fifth grade reading comprehension mean scores for the traditional group is 3.34, and the experimental group has a mean of 4.78. The $t$=3.62. The adjusted fifth grade mean reading scores for the traditional group is 3.61, and the experimental group is 4.63. The $t$=3.13. However, this should be interpreted with caution because of the small number of students (13) in the traditional group.

Raw means, adjusted means and gains for each of the schools can be found in Tables 6 and 7.

Discussion

From the data obtained in this study, one cannot assume that the experimental method produces better reading skills than the traditional. Since the scores were basically the same for both, they would probably reinforce Bruininks' (1968) belief that a child's reading skills are neither hindered nor improved by teaching to the child's preferred modality strength.

The data continued to support the fact that girls and boys did equally well with both traditional and experimental teaching approaches.

TABLE 6

READING COMPREHENSION MEAN GRADE EQUIVALENT SCORES ON THE IOWA TESTS OF BASIC SKILLS AND NON-VERBAL COGNITIVE ABILITIES TEST (I.Q.) MEAN SCORES FOR SCHOOLS

| School and Group | n | non-verbal aptitude I.Q. | Reading 3rd Grade | Reading 5th Grade | 3rd-5th Gains |
|---|---|---|---|---|---|
| Anastasis School | | | | | |
| Traditional | 13 | 89.92 | 2.39 | 3.34 | .95 |
| Experimental | 24 | 97.25 | 2.87 | 4.78 | 1.91 |
| t | | 1.68 | 1.62 | 3.62* | 3.68* |
| Broadway School | | | | | |
| Traditional | 22 | 98.18 | 2.99 | 5.02 | 2.03 |
| Experimental | 17 | 92.94 | 2.63 | 4.51 | 1.88 |
| t | | .92 | .98 | 1.21 | .46 |
| Elberon School | | | | | |
| Traditional | 32 | 108.03 | 3.62 | 5.67 | 2.05 |
| Experimental | 28 | 104.82 | 3.59 | 5.71 | 2.12 |
| t | | .82 | .10 | .11 | .31 |

(continued)

TABLE 6 (continued)

| School and Group | n | non-verbal aptitude I.Q. | Reading | | 3rd-5th Gains |
|---|---|---|---|---|---|
| | | | 3rd Grade | 5th Grade | |
| Garfield School | | | | | |
| Traditional | 22 | 93.45 | 2.92 | 4.60 | 1.69 |
| Experimental | 23 | 90.30 | 2.77 | 4.30 | 1.53 |
| t | | .75 | .60 | .90 | .56 |
| Gregory School | | | | | |
| Traditional | 28 | 98.89 | 2.67 | 4.24 | 1.57 |
| Experimental | 23 | 90.30 | 2.77 | 4.30 | 1.53 |
| t | | 2.37* | .38 | .14 | .15 |
| Lenna Conrow School | | | | | |
| Traditional | 52 | 91.12 | 2.79 | 4.70 | 1.90 |
| Experimental | 36 | 89.83 | 2.83 | 4.68 | 1.85 |
| t | | .38 | .16 | .07 | .23 |
| West End School | | | | | |
| Traditional | 17 | 106.35 | 3.68 | 5.56 | 1.88 |
| Experimental | 16 | 97.88 | 3.24 | 5.35 | 2.11 |
| t | | 1.45 | 1.01 | .53 | .77 |

* significance at .05 level.

TABLE 7

ADJUSTED READING COMPREHENSION MEAN GRADE EQUIVALENT SCORES ON THE IOWA TESTS OF BASIC SKILLS FOR SCHOOLS

| | | Reading | | |
|---|---|---|---|---|
| Group | n | 3rd Grade | 5th Grade | Gains |
| Anastasia School | | | | |
| Traditional | 13 | 2.58 | 3.61 | 1.03 |
| Experimental | 24 | 2.77 | 4.63 | 1.86 |
| t | | .75 | 3.13* | 3.15* |
| Broadway School | | | | |
| Traditional | 22 | 2.90 | 4.93 | 2.03 |
| Experimental | 17 | 2.75 | 4.63 | 1.88 |
| t | | .51 | .82 | .42 |
| Elberon School | | | | |
| Traditional | 32 | 3.56 | 5.61 | 2.05 |
| Experimental | 28 | 3.65 | 5.77 | 2.13 |
| t | | .32 | .51 | .34 |

(continued)

TABLE 7 (continued)

| Group | n | Reading | | |
|---|---|---|---|---|
| | | 3rd Grade | 5th Grade | Gains |
| Garfield School | | | | |
| Traditional | 22 | 2.88 | 4.53 | 1.65 |
| Experimental | 21 | 2.80 | 4.37 | 1.56 |
| t | | .32 | .57 | .33 |
| Gregory School | | | | |
| Traditional | 28 | 2.55 | 4.04 | 1.49 |
| Experimental | 23 | 2.91 | 4.55 | 1.64 |
| t | | 1.44 | 1.45 | .52 |
| Lenna Conrow School | | | | |
| Traditional | 52 | 2.78 | 4.67 | 1.89 |
| Experimental | 36 | 2.85 | 4.71 | 1.86 |
| t | | .45 | .18 | .15 |
| West End School | | | | |
| Traditional | 17 | 3.55 | 5.39 | 1.84 |
| Experimental | 16 | 3.38 | 5.53 | 2.15 |
| t | | .42 | .41 | 1.00 |

* Significance at .05 level.
Note: Means adjusted by I.Q.

The fourth question asked if any one school benefitted more from the experimental approach. The Anastasia School showed better results. One might attribute some of this improvement to the fact that this is the only open classroom school within the District, and new ideas may be greeted with more enthusiasm by both teachers and students. There may also be more opportunity for individualized instruction in this type of environment. One must also note the small n involved. The traditional group had only 13 children.

Five of the schools did show slight, though not significant, improvement with the experimental approach.

The results of this study on a whole would tend to conform with the majority of research which found little difference in achievement for those taught via their modality strength and those taught reading regardless of modality strength.

One might agree with Vandever and Neville (1974) that in some cases "Time spent in identifying children as having a modality strength might be better spent in instruction," (p. 200).

# CHAPTER V

## SUMMARY AND CONCLUSIONS

This chapter will summarize the study, results, draw conclusions, suggest possible limitations of this thesis, and give a suggestion for further research.

### Summary

The purpose of this study was to determine if children in the Long Branch Public School System have improved their third and fifth grade comprehension scores since the introduction of the experimental modality prescriptive-diagnostic reading program in 1973.

Two groups of children taught reading experimentally were compared with two groups of children from previous years who had been taught reading with a traditional approach. T-tests were used to locate significant differences between their third and fifth grade mean grade equivalent scores and their third through fifth grade mean gain scores on the reading comprehension section of the Iowa Tests of Basic Skills (ITBS). The Cognitive Abilities Tests (CAT) non-verbal aptitude scores were also compared by T-tests for the groups. These were later used for analyses of covariance to adjust the means.

The four large experimental and traditional groups were then broken down by sex. The traditionally taught girls were compared with experimentally taught girls and traditionally taught boys were compared with experimentally taught boys to determine if one method was more successful for boys or girls.

A further breakdown in the groups consisted of the first traditional group, group 1, and the last experimental group, group 4 (see Table 1) being divided by schools. The experimental and traditional groups were then tested in each of the seven schools to see if any of the schools benefitted more from the experimental modality prescriptive-diagnostic reading program.

Conclusions Regarding Hypotheses

Neither the traditional nor experimental reading approaches produced significantly greater reading scores. The experimental method used predominantly in kindergarten through second grade follows a modality preference plan.

No differences were found either in third or fifth grade or on gain scores between third and fifth grade using a reading comprehension test as criterion.

Basically sex differences were not found between experimental and traditional groups, however, the traditional boys do have significantly higher third grade scores than the experimental boys, yet the traditional non-verbal aptitudes are higher. Therefore, once covaried, the traditional boys' third grade scores are no longer significant.

This study looked at the difference in third and fifth grade mean reading comprehension scores or gain scores for each of the elementary schools in Long Branch. No differences were found except for one school. The Anastasia School shows significantly higher fifth grade scores and third through fifth grade gain scores for the experimental group. Five of the seven schools show higher adjusted reading scores, although not significantly, for the experimentally taught children.

The data confirms that both the traditional and experimental reading instruction methods produce similiar results in reading comprehension.

Limitations of the Study

One of the difficulties with this study was the movement of the children in and out of the District. Since only children within the District for first, third and fifth grades were included, this was not a one hundred percent population, and could represent a bias since the tendency is for the lower socio-economic students to move.

Another possible limitation is that many teachers were involved in this study and one cannot be positive that the experimental modality, prescriptive-diagnostic reading approach was followed carefully.

One additional possible limitation is that the Children's reading scores were tested in third and fifth

grades. The emphasis of the modality instruction was in kindergarten and first grade. Since the testing was much later, the effect of the training could possibly have been weakened.

Suggestion For Further Research

Since the emphasis for modality instruction is in the early primary grades, it might have been interesting to have tested children at the end of kindergarten or first grade, and then compared growth through to fifth grade.

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